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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,608	06/08/2001	Ernesto G. Jeckeln	GO35-001	1815
21567	7590	01/12/2005	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			LIU, SHUWANG	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/877,608

Applicant(s)

JECKELN ET AL.

Examiner

Shuwang Liu

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 4-7 and 9-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 8, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helms (US 2001/0014592) in view of Persson (US 6,246,286).

As shown in figure 4, Helms discloses:

(1) regarding claims 1 and 17:

an adaptive method and an adaptive device for predistorting a signal to be transmitted, supplied by a signal source to an input of a power amplifier having an output for delivering an amplified output signal, comprising:

predistorting the signal to be transmitted by means of predistortion look-up tables (LUT) interposed between the signal source (in) and the input of the power amplifier (PA);

producing, via a first digital receiver (DDC1), a first feedback signal (output from DDC1) in response to the predistorted signal (output from ADC);

producing, via a second digital receiver (DDC2), a second feedback signal (output from DDC2) in response to the amplified output signal (output from ADC) from the power amplifier;

modeling (by AE(IP)) the power amplifier in response to the first and second feedback signals; and

updating the predistortion look-up table means in response to said modeling of the power amplifier (paragraph 0033 on page 3).

Helms discloses all of the subject matter as described above except for specifically teaching the look-up tables which is an amplitude and phase look-up table as claimed.

Persson, in the same field of endeavor, teaches the amplitude and phase look-up table (111 in figure 6) in the adaptive device (column 10, lines 46-51 and column 12, lines 12-18).

One skilled in the art would have clearly recognized phase and amplitude are two basic characteristics of a signal, which cause the distortion associated with power amplifier and are measured during amplification of distortion detection signal. Based on the measured amplitude and phase distortion and known characteristics of the distortion detection signal, relationships between the input power and amplitude and phase distortion are calculated. It would be desirable to have an adaptive liberalization technique that can be effectively compensation for time-varying nonlinearities of power amplifier and at the same time relax the processing requirements of digital signal processor and decrease current consumption (column 1, line 32-column 2, line 63, Persson). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adopt the two basic characteristics of phase and amplitude in look-up table as taught by Persson in the look-up table of Helms in order to effectively

Art Unit: 2634

compensation for time-varying nonlinearities of power amplifier and at the same time relax the processing requirements of digital signal processor and decrease current consumption.

(2) regarding claim 2

wherein said first feedback signal includes the complex envelope (I and Q output from DDC1) of the predistorting signal.

(3) regarding claim 3:

wherein said second feedback signal includes the complex envelope (I and Q output from DDC2) of the amplified output signal.

(4) regarding claims 8 and 16:

a transmitter system for amplifying and up-converting a baseband signal from a signal source; said transmitter system comprising:

a power amplifier (PA) having a signal input and an amplified signal output;

a complex gain adjuster (PD1, ... PDn) interposed between the signal source and said signal input;

distorting generator (LUT) including predistortion look-up table; said distorting generator being so configured as to control said complex gain adjuster to predistort the baseband signal in amplitude and in phase;

an up-conveter (UM) receiving said predistorted baseband signal; said up-converter being so configured as to supply an up-converted predistorted signal to said signal input of said power amplifier;

a first digital receiver (DDC1) producing a first feedback signal in response to the predistorted baseband signal;

a second digital receiver (DDC2) producing a second feedback signal in response to the up-converted amplified output signal from said amplified signal output;

a control module (AE(IP)) receiving said first and second feedback signals from said first and second digital receiver', said control module being so configured as to model said power amplifier in response to the first and second feedback signals and to update said look-up table of said distorting generator in response to said modeling of said power amplifier (paragraphs 0028-0033 on page 3).

Helms discloses all of the subject matter as described above except for specifically teaching the look-up tables which is an amplitude and phase look-up table as claimed.

Persson, in the same field of endeavor, teaches the amplitude and phase look-up table (111 in figure 6) in the adaptive device (column 10, lines 46-51 and column 12, lines 12-18).

One skilled in the art would have clearly recognized phase and amplitude are two basic characteristics of a signal, which cause the distortion associated with power amplifier and are measured during amplification of distortion detection signal. Based on the measured amplitude and phase distortion and known characteristics of the distortion detection signal, relationships between the input power and amplitude and phase distortion are calculated. It would be desirable to have an adaptive linearization technique that can be effectively compensation for time-varying nonlinearities of power

Art Unit: 2634

amplifier and at the same time relax the processing requirements of digital signal processor and decrease current consumption (column 1, line 32-column 2, line 63, Persson). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adopt the two basic characteristics of phase and amplitude in look-up table as taught by Persson in the look-up table of Helms in order to effectively compensation for time-varying nonlinearities of power amplifier and at the same time relax the processing requirements of digital signal processor and decrease current consumption.

Allowable Subject Matter

3. Claims 4-7 and 9-15 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is 571 272-3036. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2634

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shuwang Liu
Primary Examiner
Art Unit 2634

January 7, 2005